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SOME USES OF CHEMISTRY IN THE COOKING WORK.

ONE of the interesting features of the science work related to the cooking is the chemical experiments worked out by the children in answer to the problems which arise. The behavior of foodstuffs under the various conditions incident to cooking suggests many questions to the young experimenters.

A class of young children, cooking vegetables, made a systematic study of their composition and of the chemical properties of their chief constituents, after which they classified the varieties studied into starchy vegetables and vegetables without starch.

Through experimentation the children learned the iodine test for starch; its thickening property and change into sugar (dextrine) through the application of heat; the test for, and the uses of, dextrine; and that starch requires a high temperature in the presence of moisture for cooking. Sweet-juiced vegetables contain sugar, and therefore it is desirable to serve the juices. These and similar facts were the bases upon which the general rules for cooking were worked out.

This class was given "cream of celery soup" to cook for the class luncheon. The celery was stewed and strained, and the juice used in the soup. The children inquired why the juice was used instead of the stalks. After discussing the matter, it was decided to find out what is in the juice which gives the "celery taste" to the soup. The children worked out their method of experimentation and set up their apparatus. Having previously made a study of tap water, the class now decided to use distilled water for the experiment, since they wished to find what the celery gave to the water. The celery was stewed in distilled water, filtered, the filtrate evaporated and the salt found.

Another class of children, making a study of dairy products, found, through experimentation, the chief constituents of milk: fat, sugar, casein, and water. They worked out the action of acid and rennet upon milk, and applied their knowledge in preparing junket, and cottage cheese for luncheon, and, later, in making "whole-milk cheese."

A class working with the flour mixtures in cooking made a study of the composition of the flour and the properties of its chief constituents. This was followed by a study of the formation and expansion of gases and the application in baking. The children made a study of acids as found in the foods, and learned to use the litmus paper to test for acids. In like manner they made a study of the alkalis. In using the litmus paper to test, and coloring it back in the opposite solution, the formation of bubbles was noticed. This led to further experimentation and the discovery of the formation of a gas. The flame and lime-water tests were made, other methods of formation discovered, and the properties of the gas studied. The children learned the use of baking powder in their flour mixtures, and the proper use of soda in baking.

Through this experimental work the children learned to look for the leavening agent in their cooking. They experimented with the yeast plant and found the gas which they used in bread-making.

Classes in the high school which have not studied chemistry and physics get the rudiments of these sciences through the problems which arise in their cooking lessons. Some of the high-school classes made baking powder, and used it in making biscuit and cake. Students, who have had physics and chemistry, consciously apply the principles in their cooking, and a knowledge of zoölogy and bacteriology also is gained.

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